PHILIP DECROOS

3B MECHATRONICS UWATERLOO

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SKILLS

- Languages - Python, C, C++, JavaScript, HTML/CSS, C#, Splunk, MATLAB, SQL
- Hardware - STM32, Raspberry Pi, Arduino, DC Motor Drivers, Multimeters, Oscilloscopes, Soldering
- Git, Jira, Jenkins, Linux, FreeRTOS, Pandas, TensorFlow, Kafka, Kubernetes, Docker, CAN, LIN, SPI, UART, I2C

EXPERIENCE

Firmware Integration Engineering Intern — Tesla / Sep 2023 - Dec 2023

- Built a cloud service to update configurations for cars during production, eliminating the manual process done 10 times per month (Python, Kafka, Kubernetes, Docker).
- Automated the validation process for changes to vehicle diagnostics firmware, removing 2 hours of validation work per PR (Python).
- Debugged firmware issues for new programs to fix them before the start of production (C, Linux).
- Updated vehicle firmware to enable CAN and LIN communication with new controller modules (C, CAN, LIN).
- Built Splunk dashboards to support the process engineering team with tracking key production metrics.

Firmware Developer — Midnight Sun Solar Car Team / Feb 2023 - Sep 2023

- Wrote embedded firmware to read user inputs and send corresponding signals to the vehicle CAN bus for operator controls including steering, indicators, and cruise control (C, FreeRTOS, CAN).

Software Test Engineering Intern — Ansys / May 2023 - Aug 2023

- Built an optimization tool for the regression test suite that reduced the computing resources required for testing by ~$10,000/year (Python).
- Wrote a code coverage analysis tool that maps which code is used by which tests and flags gaps in test coverage, eliminating the manual review every 3 months (Python, Pandas, Power BI).
- Validated new features and debugged issues for Ansys System Coupling 2024 R1 (C).

Software Engineering Intern — Ford / Sep 2022 - Dec 2022

- Built a pipeline to automate the software package building and deployment process, eliminating 3 days of work per month (Python, Jenkins).
- Developed a production test running on embedded vehicle controllers to validate their device codes and addresses, eliminating 100% of serialization defects (C++, Linux).
- Wrote test scripts to inspect hardware connections to GPIO, CAN buses, etc. during manufacturing (C#).
- Designed and built a test fixture to simulate the presence of peripherals for a vehicle controller (SolidWorks).

PROJECTS

Self-Driving Model Car — GitHub

- Wrote a computer vision model to identify the boundary of the road and plan a path to drive the car around the track as fast as possible (Python, TensorFlow).
- Designed, manufactured, and integrated a model car controlled by an Nvidia Jetson Nano (SolidWorks).

Tic Tac Toe Neural Network — Try it / Video / GitHub

- Built a neural network from scratch and trained it to play Tic Tac Toe with 97.3% accuracy (Python).

Lunar Lander Game — Video / GitHub

- Wrote a video game in which the player navigates ten moon landings (Python, Pygame).

EDUCATION

Bachelor's in Mechatronics Engineering Co-op — University of Waterloo / 2020 - 2025